Claims

The claims are amended as follows:

1-53. (Cancelled)

54. (Currently Amended) A motion estimation apparatus, comprising:

a first unit configured to select one of a plurality of sub-blocks in high-frequency sub-bands of each of one or more blocks into which each of frames of interlaced images forming a moving image is divided, the frames being hierarchically compressed and encoded into code stream data by performing discrete wavelet transform on pixel values of each of the blocks;

a second unit configured to calculate an amount of codes of each of 1LH and 1HL components of the selected one of the sub-blocks and to calculate the ratio of the amount of codes of the 1LH component to the amount of codes of the 1HL component; ~~and~~

a third unit configured to compare the calculated ratio with a threshold and to estimate that motion in the selected one of the sub-blocks is high-speed if the calculated ratio is greater than the threshold and that the motion in the selected one of the sub-blocks is low-speed if the calculated ratio is less than or equal to the threshold;

a fourth unit configured to calculate a number of the sub-blocks in which the motion is estimated to be high-speed and a total number of the sub-blocks in each of the frames, and to calculate a ratio of the number of the sub-blocks of the high-speed motion to the total number of the sub-blocks with respect to each of the frames; and

a fifth unit configured to compare the calculated ratio with a threshold and to estimate that motion in the corresponding frame is high-speed if the calculated ratio is greater than the threshold and that the motion in the corresponding frame is low-speed if the calculated ratio is less than or equal to the threshold.

55. (Canceled)

56. (Previously Presented) The motion estimation apparatus as claimed in Claim 54, wherein the amounts of codes of the selected one of the sub-blocks are amounts of losslessly compressed codes.

57. (Previously Presented) The motion estimation apparatus as claimed in Claim 54, wherein the amounts of codes of the selected one of the sub-blocks are amounts of codes before bit truncation.

58. (Currently Amended) A motion estimation method, comprising:

selecting one of a plurality of sub-blocks in high-frequency sub-bands of each of one or more blocks into which each of frames of interlaced images forming a moving image is divided, the frames being hierarchically compressed and encoded into code stream data by performing discrete wavelet transform on pixel values of each of the blocks;

calculating an amount of codes of each of 1 LH and 1 HL components of the selected on of the sub-blocks;

calculating the ratio of the amount of codes of the 1LH component to the amount of codes of the 1HL component; ~~and~~

comparing the calculated ratio with a threshold and estimating that motion in the selected one of the sub-blocks is high-speed if the calculated ratio is greater than the threshold and that the motion in the selected one of the sub-blocks is low-speed if the calculated ratio is less than or equal to the threshold;

calculating a number of the sub-blocks in which the motion is estimated to be high-speed and a total number of the sub-blocks in each of the frames;

calculating a ratio of the number of the sub-blocks of the high-speed motion to the total number of the sub-blocks with respect to each of the frames; comparing the calculated ratio with a threshold;

estimating that motion in the corresponding frame is high-speed if the calculated ratio is greater than the threshold; and

estimating that the motion in the corresponding frame is low-speed if the calculated ratio is less than or equal to the threshold.

59. (Canceled)

60. (Previously Presented) The method of claim 58, wherein the amounts of codes of the selected one of the sub-blocks are amounts of losslessly compressed codes.

61. (Previously Presented) The method of claim 58, wherein the amounts of codes of the selected one of the sub-blocks are amounts of codes before bit truncation.

62. (Currently Amended) A computer-readable recording medium storing a program for causing a computer to execute a motion estimation method, comprising:

selecting one of a plurality of sub-blocks in high-frequency sub-bands of each of one or more blocks into which each of frames of interlaced images forming a moving image is divided, the frames being hierarchically compressed and encoded into code stream data by performing discrete wavelet transform on pixel values of each of the blocks;

calculating an amount of codes of each of 1LH and 1HL components of the selected on of the sub-blocks;

calculating the ratio of the amount of codes of the 1LH component to the amount of codes of the 1HL component; ~~and~~

comparing the calculated ratio with a threshold and estimating that motion in the selected one of the sub-blocks is high-speed if the calculated ratio is greater than the threshold and that the motion in the selected one of the sub-blocks is low-speed if the calculated ratio is less than or equal to the threshold;

calculating a number of the sub-blocks in which the motion is estimated to be high-speed and a total number of the sub-blocks in each of the frames;

calculating a ratio of the number of the sub-blocks of the high-speed motion to the total number of the sub-blocks with respect to each of the frames; comparing the calculated ratio with a threshold;

estimating that motion in the corresponding frame is high-speed if the calculated ratio is greater than the threshold; and

estimating that the motion in the corresponding frame is low-speed if the calculated ratio is less than or equal to the threshold.

63. (Canceled)

64. (Previously Presented) The computer-readable recording medium as claimed in claim 62, wherein the amounts of codes of the selected one of the sub-blocks are amounts of losslessly compressed codes.

65. (Previously Presented) The computer-readable recording medium as claimed in claim 62, wherein the amounts of codes of the selected one of the sub-blocks of codes before bit truncation.